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INTERNATIONAL CENTER FOR AGRICULTURE RESEARCH IN THE DRY AREAS JOB #8 FINAL REPORT

RAMP-CLIN 0002-JO# 8-0002-ICARDA RAMP/ICARDA

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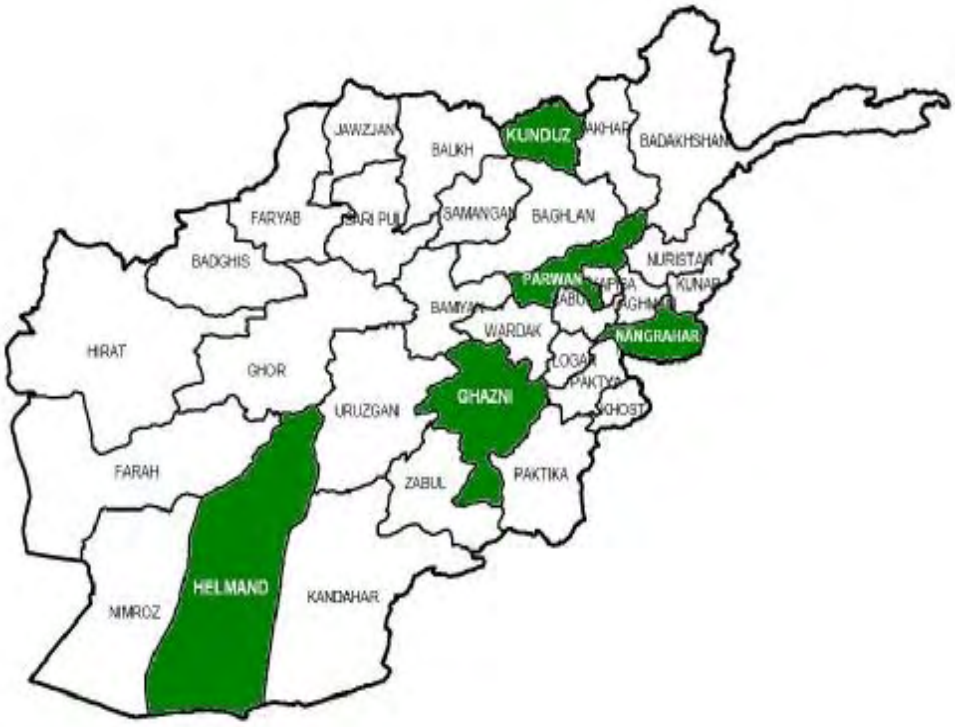
Final Project Report

Demonstration New Technologies in Farmers Fields to Facilitate Rapid Adoption and Diffusion

Reporting Period: November 2003-June 2006



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International Center for Agricultural Research in the Dry Areas (ICARDA)

May, 2006

CONTENTS

PROJECT DIGEST

1. Job Order Number: 8

2. Implementing Agency and Contact:

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3. Contact line Item Number: CLIN 2 : Agricultural Technology and Market Development

4. Reporting Period: November 2003 to June, 2006

5. Total Budget: 1,638,468.52

6. Summary of Project Activities and Impact

6.1 Institutional introduction

ICARDA (International Center for Agricultural Research in the Dry Areas) is one of 15 centers supported by the CGIAR. ICARDA's mission is to improve the welfare of poor people through research and training in the dry areas of the developing world, by increasing the production, productivity and nutritional quality of food, while pre-serving and enhancing the natural resources base. ICARD serves the entire developing world for the improvement of lentil, barley and faba bean; all dry area developing countries for the improvement of on farm water use efficiency, rangeland and small ruminant production; and the west and central Asia and North Africa (CWANA) region for the improvement of bread and durum wheat, chickpea, pasture and forage legumes, and farming systems. ICARDA's research provides global benefits of poverty alleviation through productivity improvement integrated with sustainable natural-resource management practices. ICARDA meets this challenge through the national, regional and international agricultural research and development systems. ICARDA is the leading institution of the Future Harvest Consortium to Rebuild Agriculture in Afghanistan (FHCRAA) and is significantly contributing towards achieving the FHCRAA goals, and also managing the FHCRAA activities in Afghanistan.

6.2 Summary and impacts

The overall aim of the project was to contribute to RAMP's objectives of increasing agricultural productivity and rural incomes by demonstrating available improved technologies in farmers' fields, focusing on improved varieties of field and vegetable crops that are adapted to local conditions, improved field irrigation management practices, and appropriate crop management practices**.**

At present situation the relation between agriculture research and extension is weak.
It is essential they be involved in the demonstration programs, so that in the future they can continue operating the program. The research and extension staff needs to strengthen their capabilities.

Through demonstrations the farmers clearly see the advantage of cultivating these improved varieties using new improved agro-techniques over the traditional ones. Research all over the world has shown that the farmer-to-farmer communication is the most important tool of knowledge dissemination influencing other farmers to adapt advanced agro-technologies. One of the most effective and powerful diffusion tools is developed by extension experts are performing demonstrations using a farmer's participatory approach. Therefore, the approach has a potential to play pivotal role in increasing agricultural productivity. Considering the weeknesses of the post-war extension system in Afghanistan, need and utility of participatory demonstrations has increased by many folds.

The demonstrations through the project were designed to show farmers the advantages of improved varieties and crop management practices, compared with their traditional practices. The demonstrations encompassed a limited number of variants, focusing on very specific aspects, so that the farmers can easily interpret the results. The project established 966 on-farm demonstrations in a total of 27 districts in five provinces of Kunduz, Nangarhar, Parwan, Ghazni, and Helmand. Demonstrations focused on six principal crops of wheat, rice, mung bean, potato, onion and tomato, during 2004 croping season, but, during 2005 okra, peanuts, and cotton were also added for demonstrations.. Key inputs and management practices, including improved varieties, fertilizer dose, seed rate, weed control, irrigation scheduling, and transplanting (in case of rice and onions) were also included in the program. In the first year, demonstrations were established based on current knowledge of best practices and available technological options. At the same time during the first year, the project conducted surveys within the farming communities in each district to ascertain farmers' preferences, existing constraints and thereby assess

potential constraints to the adoption of the improved practices. Demonstrations in subsequent were adjusted accordingly.

The demonstration plots during the year 2003/04 and 2004/05 produced an amount of 668.2 mt of wheat, 270.52 mt paddy rice, and 154.5 mt mung bean seeds which makes the total of 1093.8 mt pure seed for distribution to farmers in the area and beyond. This seed was made available for a total area of 3,818 hectares of wheat, 6,011 hectares paddy rice and 3,090 hectares of mung beans. Moreover, the project produced a total amount of 1313.7 mt of potatoes, 959.0 mt onion, 630.0 mt tomatoes, 293.9 mt okra, 62.6 mt peanuts, and 81.32 mt of cotton (Table 17 and 20). The demonstration plots on 5 crops during 2004 showed an average of 51.38 percent yield increase over the farmers' where as the average increase during 2005 for 9 crops was 52.77 percent (Table 16 and 18). The impact of improved varieties of wheat, rice, potatoes, onions and tomatoes with an assumed modest adoption rate of 10 percent in the 5 target provinces would lead to an average income of $19,386,876. In addition, the impact of improved agronomic practices such as seed rate, fertilizer and irrigation in the same provinces is expected to save $26,265,000 (Table 21 and 22).

6.3 Specific objectives of the project

- Designing and evaluating the ability of demonstrated technology in improving agricultural productivity and income generation.
- Showing farmers the advantages of improved varieties and best crop management practices in comparison to their traditional practices.
- Promoting the use of high quality seed and varieties on the part of the farmers.
- Providing technical assistance in the rapid transfer of proven and viable technologies and the development of sustainable agricultural production systems in Afghanistan.
- Building up skills and knowledge of the farmers and extension workers and providing answers to their questions during the field days.
- Developing and improving relationships between research and extension departments.
- Observing the resources base and environment through demonstrating wise use of resources and environment friendly technologies.
- Implementing methods of extension for the training the farmers.

7.1 Tasks Completed During the Reporting Period

- Following improved crop varieties were disseminated rapidly through demonstrations in farmers' fields:

  a. Paddy rice: Kunduz-1
  b. Wheat: Gul-96, Solh -2002, Amu-99, Roshan-96, Lalmi- 2, Mazar-99 and Dima-96.
  c. Potato: Chandramukhi, Desiree and Cardinal
  d. Onion: Red Creole
  e. Tomato: Kabul 64 and Rio Grand
  f. Mung bean: Nayab-92
  g. Okra: Shazadgai and Pusa Swani
  h. Cotton: Acala 15 17-99
  i. Peanut: Virginia Jumbo

- Implemented 360 demonstrations during 2003-2004 against the target of 341 planned in 27 districts of the five provinces (Table-1).

- Implemented 356 demonstrations as compared with planned 341 demonstrations during 2004 -2005 (Table-2).

- Implemented 250 demonstrations during 2005-06.

- Through demonstrations a total of 966 farmers have benefited directly.

- Besides using of the improved varieties of crops, best agronomic practices such as use of optimum fertilizer and seed rate; applying weed control methods; and using transplanting method for tomatoes, onions and paddy for row planting were included in the demonstration plots.

- Provided scientific recommendations on the amount and time of water applications on wheat crop. This has proved much useful since the farmers were applying more water than needed without any increase in yield.

- Provided recommendations on the optimal amount of wheat seed rate: 140 kg versus 280 kg commonly practiced rate per hectare.

- In comparison to farmers' field a higher amount of yield difference has been achieved in demonstration fields. For instance in 2003-2004 and in 2004-2005 the yields of demonstrations were 51.38 and 52.56 % higher than the farmers' fields, respectively (Table 16 and 18).

- A total of 27 field days in 2003-2004, 31 in 2004-2005 and 10 in 2006 crop season were organized on the demonstration plots that were attended by farmers from neighbouring communities. These field days provided useful information on the improved crop varieties and agronomic practices that facilitated the adoption of improved technologies in the five target provinces.

- Published 17 technical publications and one poster with practical and simple information for awareness creation and diffusion of information that speeded up the process of technology adoption.

- The project conducted annual survey within the farming communities in each target district to ascertain farmers' preferences and existing constraints and thereby to assess potential constraints to the adoption of the improved practices.

- Established nursery demonstrations for rice, tomato and onions to produce vigorous and healthy seedlings for transplantation, and also saves land, water and labours.

- Assessed the extent of adoption of improved practices by farming communities by following up with all farmers who have visited the demonstrations and or attended farmers field days.

- Produced clean and high quality seeds through rouging the demonstration plots of wheat, rice and mung beans.

- Demonstrated/ recommended wheat (Amu-99, Roshan -96 ,Lalmi-2,Mazar-99, and Heart-99),Tomatoes (Rio Grand), Potatoes (Kufri Chandramukhi, and Desiree, Cardinal) and Okra (Shahzadgia) for warmer parts of the country.

- Recommend cotton Acala (15 17 -99), peanut (Virginia Jumbo), and mung bean (Nayab-92) for Helmand and Kunduz provinces.

- Recommended wheat (Gul-96 and Solh -2002); tomatoes (Kabul 64); okra (Pusa Sawani), and potatoes (Kufri Chandramukhi) for the cold areas of the country.

- Row transplanting method of rice and onions were demonstrated to the growers in all the five provinces that lead to saving of labour during weeding, land and water. Traditionally, onions are cultivated through broad casting that requires 3-4 more irrigation and several times weeding as compared with transplanting.

- About 1,000 farmers were directly trained through participatory demonstrations.

- More than 8,700 farmers, extension agents, NGOs staff have been trained during field days in the target provinces.

- An estimated 220,724 farmers were contacted by the extension workers who also visited demonstrations. Besides, an estimated 534,752 people read the signboards placed at the demonstration sites.

- More than 6 million estimated listeners were informed about demonstrations through coverage of field days by TV and Radio.

- An amount of 1092 mt pure seed of wheat, rice and mung bean crops were produced through demonstrations in two years that covered an estimated area of 12,919 hectares (Table 17 and 20).

7.2 How demonstrations fits in the overall development of the agricultural sector:

- Demonstrations play an important role in the arena of agriculture to identify specific crop varieties and improved agronomic practices to be used in agriculture development. This task has been undertaken by this project in demonstrating new technologies to the farmers to encourage adoption.

- The development of agriculture depends on the capacity of the farmers and extension staff. This project has tremendously contributed to this objective through conducting demonstrations and organizing field days for the farmers, extension workers, entrepreneurs, and agro-dealers.

- The project has also contributed to the development of market networks both for seed being produced, and for the supply of different farm inputs to be obtained through market channels. Field days and informal meetings/ discussions provided the opportunities to dealers/ entrepreneurs to contact the owners of demonstrations and discuss matters of mutual interests. This linkage is a key to private sector development and boosting business opportunities in local areas.

- This project has been conducted through active participation of the extension department of the MAI, and thereby it further strengthens the relationships between the farmers and the MAI in better targeting the sub-sector and agricultural development. New improved varieties of different crops were introduced and multiplied according to different environmental conditions of Afghanistan.

8. Lessons Learned and Recommendations for Future Activities

- Extension department of MAI should play more active role in conducting demonstrations to ensure the sustainability of the program.

- In order to reach and help more farmers the programs should cover more provinces against only five RAMP targeted provinces.

- Special training courses for the extension workers and farmers need to be jointly assessed and conducted by research and extension departments of the MAI, and ICARDA for improving the knowledge and building their skills further.

- Linkages between the demonstration program, Village Based Seed Enterprises (VBSEs) and entrepreneurs need to be strengthened. VBSEs have to be encouraged to conduct their own demonstrations.

- Experience of this project that demonstrations can also be used as a source of improved seed to neighbours and relatives of the demonstration owners can be extrapolated to other similar programs.

- Since the clean and good quality seeds are produced in demonstrations, the seed could be considered as pure and quality declared seed for which prices can be adjusted at par to the seed produced by VBSEs.

9. Summary of Projects Relationship and Coordination with Government of Islamic State of Afghanistan and Appropriate Ministries during the Course of this Project

- The project proposal was developed in close collaboration of the MAI

- Implementation of the project in all the target provinces was done in collaboration with the provincial directorates of agriculture. Extension workers introduced by General Director of agriculture of the respective provinces played pivotal role in selection of participatory farmers and in data collection.

- ICARDA activities were always in consultations with the agricultural departments and other Governmental agencies in the provinces. During the field days and trainings, the Governors; DG of agriculture extension Director; extension workers; representatives of RAMP, NGOs, Traders' Associations, and of other developmental agencies always participated.

- University students and teachers/ students of agricultural schools were also invited in the field days to build their capacity and show them the impact of the demonstrations.

The activities of ICARDA in all the five target provinces were regularly monitored by the advisors and high officials of the MAI. They always appreciated acclaimed ICARDA's role and work in the rebuilding of Agriculture in the country (See letters from Ministry Officials in Dari as attachments 1to 4).

Table 1
Planned and actually implemented demonstrations during 2003-2004

Province/ crops	Demonstrations		Number of districts
	Planned	Planted	
Ghazni			Joghori,Qarabagh,Center,K.Omary,Nawar
Wheat	30	30	
Potato	10	10	
Onion	10	10	
Tomato	5	5	
Sub-Total	**55**	**55**	
Helmand			Lashkargah, N. Ali,Germser,Nawa,Grishk
Wheat	30	30	
Potato	10	10	
Onion	10	10	
Tomato	5	-	
Sub-Total	**55**	**50**	
Kunduz			Center,I.Sahib,Archi,K.Abad,Chardarah,A.Abad
Wheat	49	50	
Potato	10	11	
Onion	6	9	
Tomato	5	10	
Rice	30	30	
Mungbean	3	5	
Sub-Total	**103**	**115**	
Nangarhar			Behsude,Sourkhroud,Kogyani,Baticot,Kama
Wheat	36	37	
Potato	10	10	
Onion	10	12	
Tomato	5	5	
Rice	10	17	
Mung bean	2	4	
Sub-Total	**73**	**85**	
Parwan			Charikar,Jabalsaraj,Ghorband,Bagram,Sourkh P.
Wheat	30	30	
Potato	10	10	
Onion	10	10	
Tomato	5	5	
Sub-Total	**55**	**55**	
Grand total	**341**	**360**	

Table 2
Planned and actually implemented demonstrations during 2004-2005

Province/ crops	Demonstrations		Number of districts
	Planned	Planted	
Ghazni			Joghori,Qarabagh,Center,K.Omary,Nawar
Wheat	24	24	
Potato	8	8	
Onion	4	4	
Sub-Total	**36**	**36**	
Helmand			Lashkargah, N. Ali,Germser,Nawa,Grishk
Wheat	30	31	
Potato	10	10	
Onion	5	5	
Tomato	5	5	
Okra	10	10	
Peanut	5	5	
Cotton	10	10	
Mung bean	10	10	
Sub-Total	**85**	**86**	
Kunduz			Center,I.Sahib,Archi,K.Abad,Chardarah,A.Abad
Wheat	18	18	
Potato	12	15	
Onion	6	6	
Tomato	6	12	
Rice	12	13	
Mung bean	3	5	
Peanuts	12	12	
Okra	12	12	
Cotton	12	14	
Sub-Total	**102**	**114**	
Nangarhar			Behsude,Sourkhroud,Kogyani,Baticot,Kama
Wheat	18	18	
Potato	12	14	
Onion	6	6	
Tomato	6	6	
Rice	8	8	
Mung bean	5	5	
Okra	5	5	
Sub-Total	**60**	**62**	
Parwan			Charikar,Jabalsaraj,Ghorband,Bagram,Sourkh P.
Wheat	30	30	
Potato	10	10	
Onion	5	5	
Tomato	5	5	
Okra	4	4	
Mung bean	4	4	
Sub-Total	**58**	**58**	
Grand total	**341**	**356**	

Table 3
Crop calendar developed and used for wheat in cold areas
(Ghazni, Parwan, and Kunduz)

No.	Activities	Months											
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep
1	Farmer selection		xxxx										
2	Seed & fertilizer procurement	xxxxxx											
3	Land preparation	xxxxxx											
4	Planting		xxxxxxxxxx										
5	Irrigation							xxxxxxxxxxxxxx					
6	Weeding						xxxxxxxxxxxxxxxxxx						
7	Farmers field days								xxx	x			
8	Monitoring and evaluation			xxxx	xxx	xxx	xxx	xxx	xxx	xxx			
9	Training		xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx										
10	Harvesting									xxxxxxxx			
11	Threshing										xxxxxxxxxxxxxxx		
12	Data collection analysis								xxxxxxxxxxxxxxxxxxxxxxxxxxxx				
13	Reporting	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx											

Table 4
Crop calendar developed and used for wheat crop in warmer areas (Helmand and Nangarhar)

No	Activities	Months										
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
1	Farmer selection		xxxx									
2	Seed & fertilizer procurement	xxxxxxxx										
3	Land preparation		xxxxxxxxx									
4	Planting		xxxxxxxxx									
5	Irrigation			xxxx			xxxxxxxxxxxxx					
6	Weeding						xxxxxxxx					
7	Farmers field days						xxxx					
8	Monitoring and evaluation		xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx									
9	Training		xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx									
10	Harvesting								xxxxxxxx			
11	Threshing								xxxxxxxx			
12	Data collection analysis									xxx		
13	Reporting	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx										

Table 5
Crop calendar developed and used for tomatoes in warmer areas (Helmand and Nangarhar)

No	Activities	Months										
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
1	Seed & fertilizer procurement				xxx							
2	Identification of farmers			xxxxxxxxxx								
3	Nurseries establishment					xxx						
4	Land preparation					xxxxxxxx						
5	Transplanting						xxxxxxxx					
6	Irrigation					xxxxxxxxxxxxxxxxx						
7	Weeding						xxx					
8	Farmers field days									xxx		
9	Monitoring &field inspection					xxxxxxxxxxxxxxxxxxxxxxx						
10	Training					xxxxxxxxxxxxxxxxxxxxxxx						
11	Plant selection for seed									xxxxxxxxx		
12	Harvesting									xxxxxxxxx		
13	Reporting			xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx								

Table 6
Crop calendar developed and used for tomatoes in colder areas
(Kunduz, Parwan and Ghazni)

No	Activities	Months											
		Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
1	Seed & fertilizer procurement	xx											
2	Identification of farmers	xxxxxxxxxxxxx											
3	Nurseries establishment				xxxxxxx								
4	Land preparation						xxxxxxx						
5	Transplanting						xxxxxxxx						
6	Irrigation					xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx							
7	Weeding							xxxxxxxxxxxxxxxxxx					
8	Farmers field days									xxxxxxx			
9	Monitoring &field inspection					xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx							
10	Training								xxxxxxxx				
11	Plant selection for seed										xxxxxxx		
12	Harvesting								xxxxxxxxxxxxxxxxxxx				
13	Reporting	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx											

Table 7
Crop calendar developed and used for onion in warmer areas
(Helmand and Nangarhar)

No	Activities	Months										
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
1	Seed procurement	xxxxxxxxxxxxxxxxxxxxxxxxx										
2	Nursery establishment		xxxxxxxxxxx									
3	Land preparation			xxxxxxxxxxxxxxxx								
4	Transplanting						xxxxxxx					
5	Irrigation		xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx									
6	Weeding			xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx								
7	Farmers field days								xxx			
8	Monitoring & Evaluation	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx										
9	Training				xxxxxxxxxxxxxxxx							
10	Harvesting								xxxxxxxxxxxxxxxxxx			
11	Bulb selection for seed								xxxxxxxxxxx			
12	Reporting											

Table 8
Crop calendar developed and used for onions in colder areas
(Kunduz, Parwan, Ghazni)

No	Activities	Months										
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
1	Seed procurement	xxxxxxxxxxxxxxxxxxxxxxxxx										
2	Nursery establishment		xxxxxxxxx				xxxxxx					
3	Land preparation						xxxxxxxxx					
4	Taransplanting								xxx			
5	Irrigation	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx										
6	Weeding	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx										
7	Farmers field days											xxx
8	Monitoring & Evaluation	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx										
9	Training									xxxxxxxxx		
10	Harvesting											xxx
11	Bulb selection for seed											xxx
12	Reporting	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx										

Table 9

Crop calendar developed and used for potatoes in Parwan and Ghazni

No.	Activities	Months									
		Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	
1	Seed & Fertilizer procurement		xxxxxxxx								
2	Farmers selection		xxxxxxxx								
3	Land preparation		xxxxxxxxxxxx								
4	Planting			xxxxxxxx							
5	Urea application				xxxxxxxxxxx						
6	Irrigation		xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx								
7	Earthling up				xxxxxxxxxxx						
8	Plant protection			xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx							
9	Roguing							xxxxxxxx			
10	Aphid monitoring				xxxxxxxxxxxxxxxxxxxxxxxxxxxx						
11	Farmers field day						xxxxxxxx				
12	Field training			xxxxxxxxxxxxxxxxxxxxxxxxx							
13	Dehualming and harvesting								xxxxxx		
14	Reporting		xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx								

Table10

Crop calendar developed and used for spring season potato planting in Nangarhar, Helmand and Kunduz provinces

No.	Activities	Months										
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
1	Seed & fertilizer procurement		xxxxxxxxxxxxx									
2	Site selection				xxxxxxxxx							
3	Land preparation					xxxxx						
4	Planting					xxxxxxxx						
5	Urea application							xxxxxxxxxxxxxx				
6	Earthing up							xxxxxxxxxxxxxx				
7	Plant protection					xxxxxxxxxxxxxxxxxxxxxxxxx						
8	Roguing							xxxxxxxxxxxxxxxx				
9	Aphid monitoring							xxxxxxxxxxxxxxxxxx				
10	Farmers field days									xxxxxxxx		
11	Field training								xxxxxxxxxxxxx			
12	Dehaulming and harvesting									xxxxxxxx		
13	Reporting		xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx									

Table 11
Activity plan for fall-potato demonstrations in Nangarhar and Helmand provinces

No.	Activities	Months				
		Aug	Sep	Oct	Nov	Dec
1	Seed & fertlizer procurement	xxxxxx				
2	Site selection	xxxxxx				
3	Land preparation	xxxxxxxxxxx				
4	Planting		xxxxxxx			
	Irrigation		xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx			
5	Urea application			xxx		
6	Earthing up			xxx		
7	Plant protection			xxxxxxxxxxxxxxxxxxxxxxxxxxx		
8	Roguing				xxxxxxxxxxxx	
9	Aphid monitoring			xxxxxxxxxxxxxxxxxxxxxxxxxxxx		
10	Farmers field days					xxx
11	Training			xxxxxxxx		
12	Dehaulming and harvesting					xxxxxx
13	Reporting	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx				

Table12

Activity plan for fall-potato demonstrations in Kunduz

No.	Activities	Months								
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1	Seed & fertlizer procurement	xx								
2	Site selection	xxxxx								
3	Land preparation	xxxxxxx								
4	Planting		xxxxxxxxxxx							
5	Irrigation						xxxxxxxxxxxxxxxxxxxx			
5	Urea application							xxxxxxxxxx		
6	Earthing up							xxxxxxxxx		
7	Plant protection		xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx							
8	Roguing								xxxxxxxx	
9	Aphid monitoring							xxxxxxxxxxxxxx		
10	Farmers field days								xxxx	
11	Training						xxxxxxxxxxxxxxx			
12	Dehaulming and harvesting								xxxxxxxx	
13	Reporting	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx								
14										

Table13

Activity plan for rice demonstrations in Kunduz and in Nangarhar

No.	Activities	Months								
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
1	Seed & fertilizer procurement	xxxxxxxx								
2	Site selection	xxxxxxxx								
3	Nursery bed preparation		xxxxxxxx							
4	Land preparation &transplanting			xxxxxxxxxxx						
5	Weeding			xxxxxxxxxxxxxxxxxxxx						
6	Urea application			xxxxxxxxxxxxxxxxxxxx						
7	Rouging					xxxxxxxxxxxxxxxx				
8	Farmers field days							xxxx		
9	Training							xxxx		
10	Harvesting									xxxx
11	Reporting	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx								

Table 14

Activity plan for mung bean demonstrations in Nangarahar and in Kunduz

No	Activities	Months							
		May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Seed procurement	xxxxxxxxx							
2	Site selection		xxxx						
3	Land preparation			xxxx					
4	Sowing			xxxx					
5	Irrigation			xxxxxxxxxxxxxxx					
6	Plant protection			xxxxxxxxxxxxxxxxxxxxxxxxx					
7	Field days					xxxxxxxxxx			
8	Harvesting					xxxxxxxxxx			
9	Reporting	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx							

Table 15

Targets achieved in the five RAMP provinces

No.	Activity	Number		Comments
		Target	Achieved	
1	Demonstrations	1023	966	57 demonstrations could not be completed because project ended before completion of the 2006 cropping season
2	Field days	84	63	27 demonstrations could not be completed because project ended before completion of the 2006 cropping season
3	Guide produced	12	18	One each in Dari and Pashto on wheat, rice, mung bean, cotton, peanut, tomato, potato, , onion, and okra
4	Guides distributed	2160	3150	In Dari and Pashto
5	Farmers trained	2025	8,411	Through field days

Table 16

Comparison of average yield of target crops in demonstrations with those of farmers' fields during 2004.

Crops	Yield (mt/ha)		Differences (mt/ha)	Percent difference
	Demonstrations	Farmers		
Wheat	3.92	2.82	1.10	39.00
Rice	6.84	4.35	2.49	57.24
Potato	16.38	11.32	5.06	44.69
Onion	23.64	16.41	7.23	44.05
Tomato	27.46	15.97	11.48	71.94
			Average	**51.38**

Table17
Amount of different crop seeds produced in demonstration plots during 2004 cropping season

Province	Wheat	Rice	Potatoes	Onions	Tomatos	Mung bean
Kunduz	28.20	40.82	37.50	39.95	54.92	1.50
Nangarhar	34.50	20.90	39.10	57.51	18.37	1.86
Helmand	27.75	-	35.30	13.10	-	-
Ghazni	14.43	-	40.55	49.74	15.40	-
Parwan	28.20	-	29.55	71.26	44.45	-
Total	**133.08**	**61.72**	**182.00**	**231.53**	**133.14**	**3.36**

Table 18

Comparison of average yield of target crops in demonstrations with those of farmers' fields during 2005

Crops	Yield (mt/ha)		Difference (mt/ha)	Percent difference
	Demonstrations	Farmers		
Wheat	4.89	2.87	2.02	70.38
Rice	7.10	4.82	2.28	47.3
Potato	23.31	16.65	6.66	40.00
Onion	34.03	23.14	10.89	47.06
Tomato	33.44	22.15	11.29	50.97
Okra	12.65	8.68	3.97	45.73
Mung Bean	1.69	1.09	0.60	55.04
Peanut	5.08	2.88	2.20	76.38
Cotton	3.51	2.47	1.04	42.10
Average				**52.77**

Table 19

Comparison of average yield of target crops in demonstrations with those of farmers' fields in Kunduz, Nangarhar and Helmand provinces during 2006

Crops	**Yield (mt/ha)**		**Difference (mt/ha)**	**Percent difference**
	Demonstrations	**Farmer**		
Wheat	4.98	3.40	1.58	46.4
Potato	18.44	10.97	7.47	68
Onion	29.38	20.16	9.21	45.7
Average				53.36

Table 20
The amount of different types of seeds and total production in demonstration plots in the five provinces during 2005 crop season

Province	Seed (mt/ha)					Production (mt/ha)			
	Wheat	Rice	Potato	Mung bean	Peanut	Tomato	Cotton	Onion	Okra
Kunduz	82.34	138.28	328.63	114.86	39.44	45.58	36.43	95.37	18.139
Helmand	166.20	-	41.21	21.00	23.15	110.00	44.89	145.00	162.80
Nangarhar	99.40	70.6	244.28	10.92	-	171.10	-	176.20	70. 00
Parwan	156.10	-	273.35	5.36	-	170.10	-	175.00	43. 00
Ghazni	31.10	-	244.25	-	-	-	-	135.90	-
Total	535.10	208.88	1131.45	152.14	62.59	496.78	81.32	727.47	293.93

Table 21

The impact of improved varieties and of adoption on the total income of farmers under 5 target provinces

Crop	Area (ha)	New area covered at 10% adoption	Yield difference between demos. and that of farmers' (mt)	Additional production (mt)	Price US $ /mt	Total income (US $)
Wheat	309000	30,900	1.56	48,204	200	9,640,800
Rice	86270	8627	2.39	20618	400	8,247200
Potato	4800	480	5.86	2813	220	618,816
Onion	2620	262	9.06	2373	200	474,600
Tomato	1627	162	11.38	1843	220	405,460
Total						**19,386,876**

Table 22

The impact of best practices on farmers' income in 5 provinces

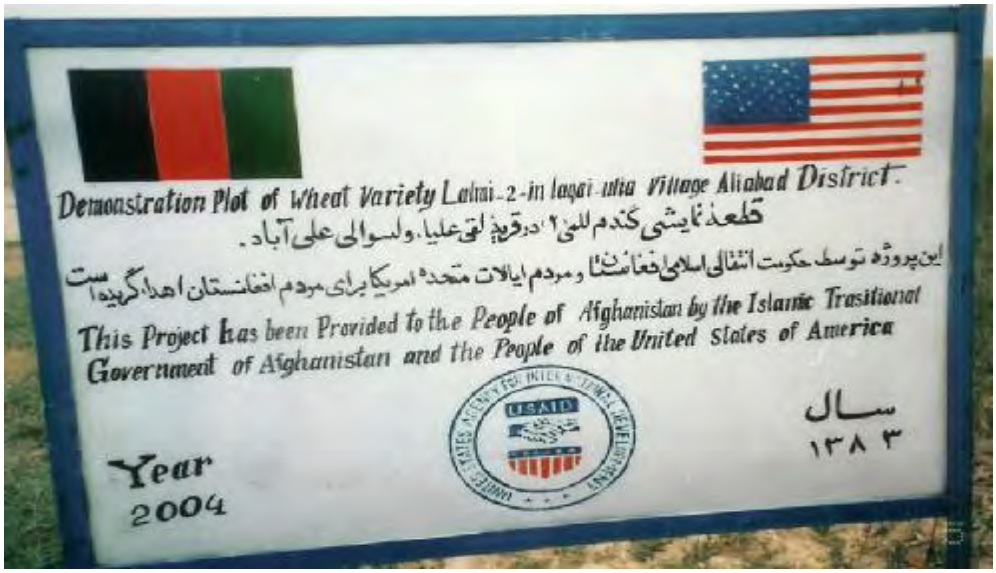
Best Practices	Total area under irrigated wheat	Inputs		Differen-ces (mt/ha)	Total inputs saved (mt)	Input price/ mt (US$)	Total income (US $)
		Farmers'	Demos.				
Seed rate kg /ha	309,000	250	175	0.075	23175	200	4,635,000
Fertilizer DAP kg /ha	309,000	250	125	0.125	38625	440	16,995,000
Irrigation	309,000	9000 M^3/ha	6500 M^3/ha	2500 M^3/ha	772,500,000 M^3	0.006 / M^3	4,635,000
Total							**26,265,000**

Table23

Total yield of demonstrations during 2004-2005 and the area that could have been brought under cultivation

Crop	Yield (mt/ha)			Area covered (ha)
	2004	2005	Total	
Wheat	133.08	535.10	668.18	3818
Rice	61.72	208.80	270.52	6011
Potato	182.00	1131.72	1313.72	656.00
Onion	231.5	727.47	958.97	383.00
Tomato	133.2	496.78	629.98	314500
Mung bean	3.36	151.14	154.5	3090.00
Okra	-	293.93	293.93	9766.00
Peanut	-	62.59	62.59	250.00
Cotton	-	81.32	81.32	1 355.00
Total	744.86	3688.85	4433.71	

10. Photograph, Human Interest and Beneficiary Stories

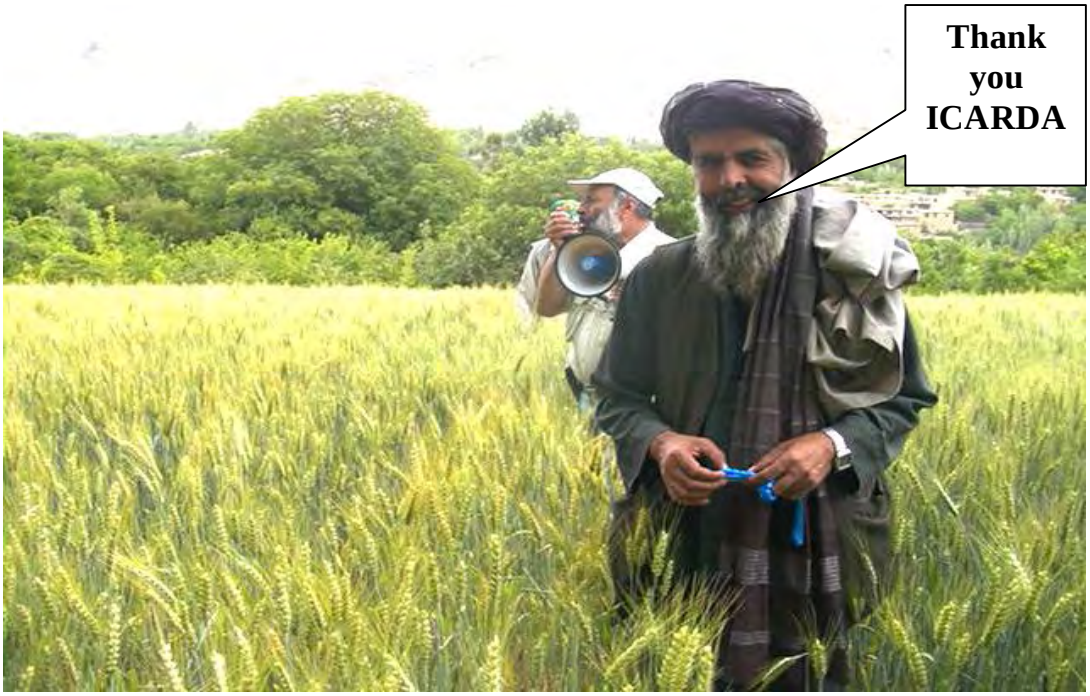


Participants of field day at Khanabad (Kunduz) visiting potato field with ICARDA team

Farmers comparing the improved variety (Kufri Chandramukhi-KCM-right) with a local variety in Ghazi

Training about grading, packing and marketing of tomato in Nangarhar

Rice transplantation in Nangarhar



Smiling owner of wheat demonstration plot: Happy for a good yield prospect of Gul-96 said "Thank you ICARDA"

Farmers comparing ICARDA introduced variety (Gul-96 – right) with French Anadalope variety supplied by some other NGOS in Charikar, Parwan

Farmers evaluating potato demonstrations in Ghazni

Farmer hand weeding his paddy rice in Nanga

Mr. Sultan Hussain Abassyar, Director of Agriculture (Ghazni) speaking at the inauguration of field day in center Ghazni

Mr. Hasham, Deputy Governor of Kunduz-, recognized ICARDA as the most active and dedicated developmental organization in the province

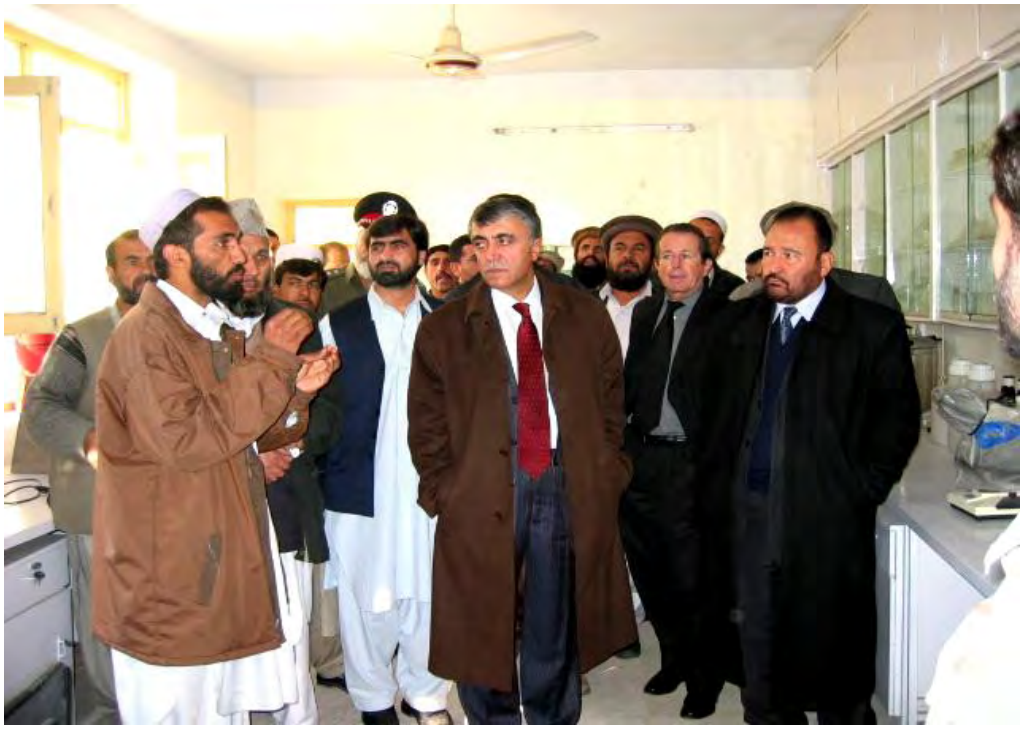
Director General of Agriculture Department of Ghazni appreciated Projects' efforts and thanked ICARDA to introduce resource poor farmers to new agro-technologies

Mr. Taoos, Head of the Planning Department of MAI (extreme left-second row; Mr. Turkman, DG of Agriculture, Kunduz (extreme left first row); Dr. Samin of Chemonics; and Mr. Randy of PRT along with other participants at the inaugural session of field day in Kunduz

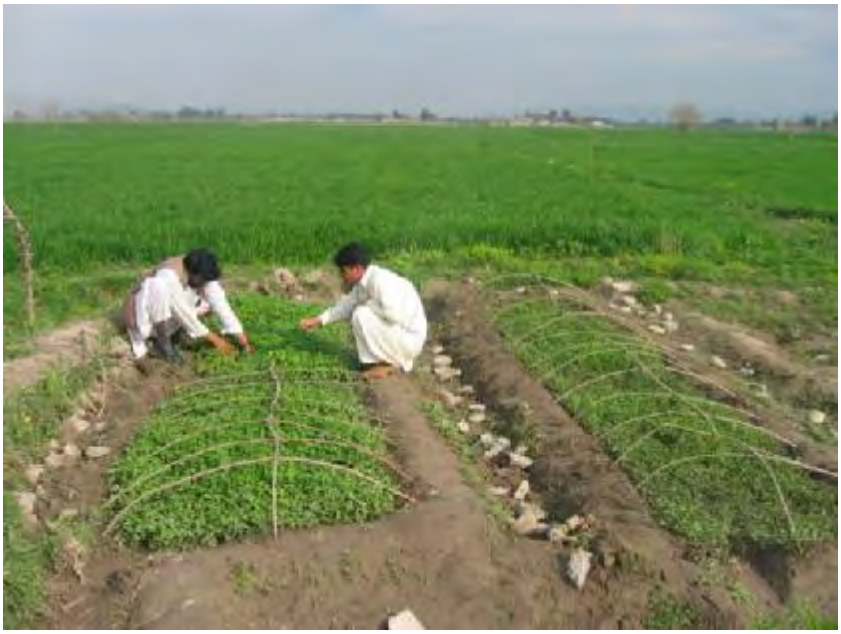
Haji Ramazan (Char Burja village, Khoja Omari district) of Ghazni expressing his happiness over the performance of Red Creole variety of Onion

MAI Advisor Mr. Gardezi and Dr. Samin of RAMP Reviewing the progress of work with farmers in Kama(above)and in Behsood (below)

Onion nursery in Nangarhar



H.E the Minister of Agriculture, Animal Husbandry and Food Mr. Ubaidullah Ramin (center); the Deputy Minister Mr. Sharif (first from left), and other Ministry Officials visited ICARDA activities at Nangarhar



Tomato seedlings ready for transplanting in Nangarhar

Khalid Wadan of ICARDA accepting a letter of appreciation from HE the Governor of Nangarhar

A team of RAMP visiting demonstration plots in Nangarhar

Wheat demonstration ready for harvesting in Germsir (Helmand)

Farmers visiting potato demonstrations during a field day in Kunduz

Potato field day in Surkhrud (Nangarhar)

Neighboring farmers visiting potato demonstration in Qara Bagh

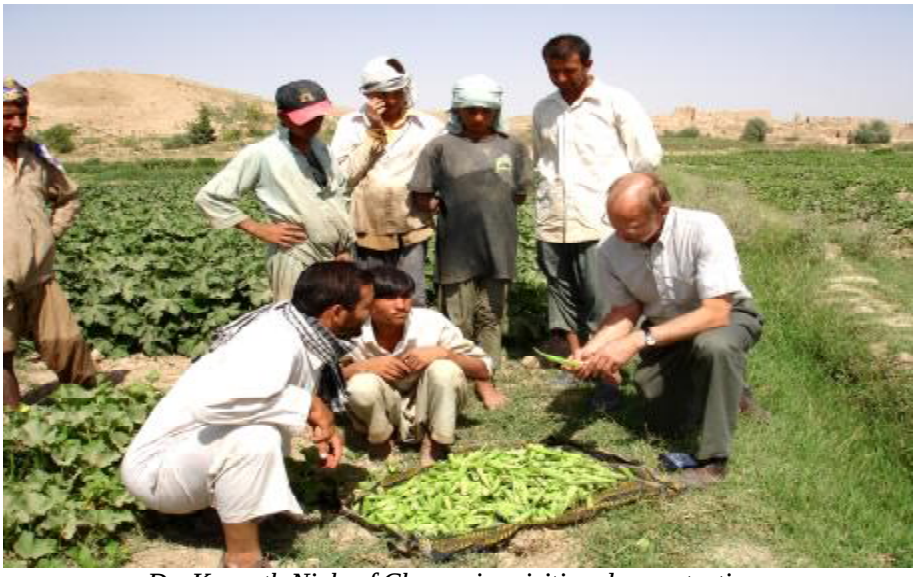
Cotton demonstration plot in Nad-Ali

*"Red Creole is indeed a superior quality onion that is fetching us a **higher price"***

Thinning? That is something we never heard of-Thanks to ICARDA for training us

Thinning in mung bean demonstration plot in Nangarhar

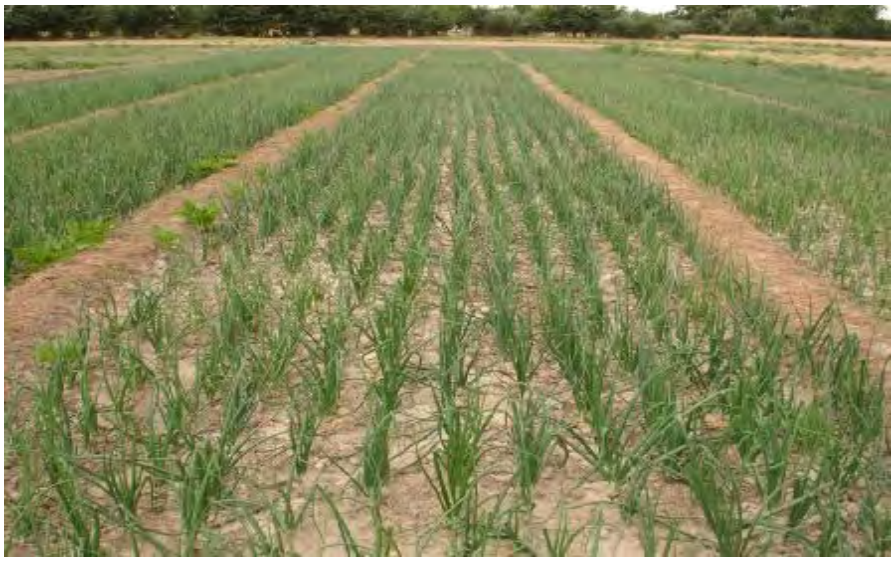
A moment of joy for the family: Picking of okra in progress in Dobandi Village of Chardarah district (Kunduz)



Dr. Kenneth Niels of Chemonics visiting demonstrations in Kunduz

Harvesting of the demonstration plots of Okra (Pusa Sawani) in Kunduz

Harvesting, grading and packing of tomatoes by participating farmers in Kunduz



The demonstration of transplanting technology of onion in Ghazni province

Harvesting of onion in Kunduz province

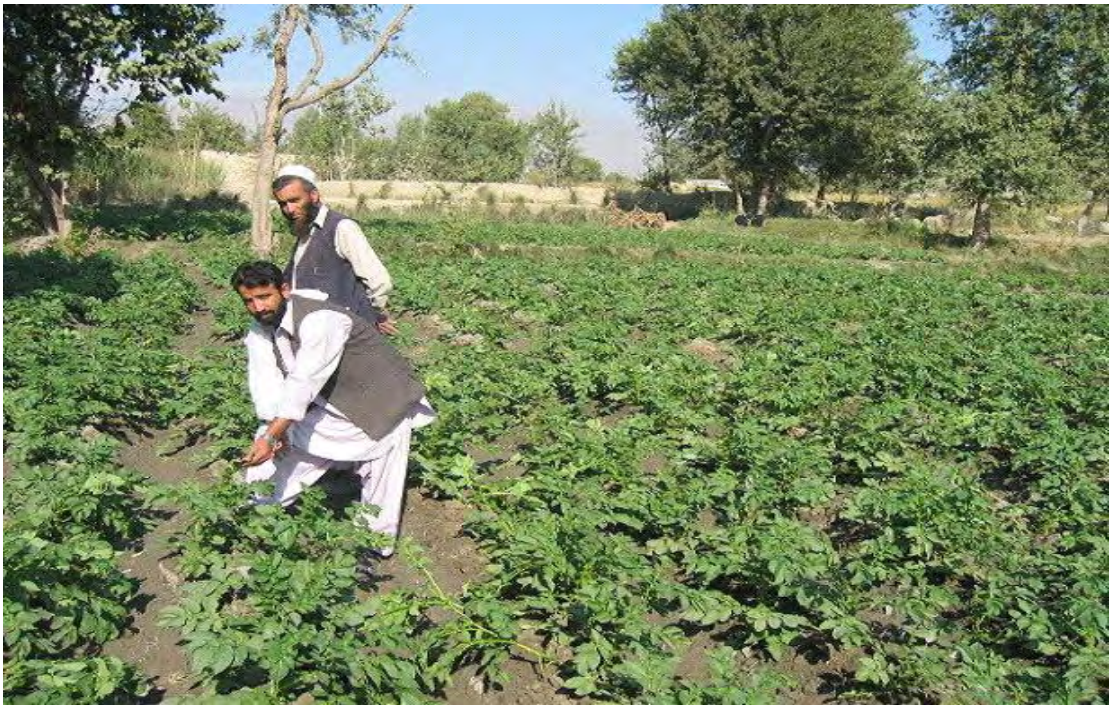
The performance of the cotton (Acala 1517-99) in demonstration plots in Kunduz

Demonstration field of the peanut (Virginia jumbo) in Kunduz

Peanuts (Virginia Jumbo) from Kunduz demonstration

Field of rainfed potato in Khananabad district of Kunduz

Dehwairan village of Khanabad district of Kunduz



Tomato and cotton demonstrations in Helmand

Wheat and onion demonstrations in Helmand

Rainfed field of the variety Lalmi-2 in Aliabad of Kunduz

11. Performance indicator

Activity	Number		Comments
	Target	Achieved	
Demonstrations	1023	966	57 demonstrations could not be completed because project ended before completion of the 2006 cropping season
Field days	84	63	27 demonstrations could not be completed because project ended before completion of the 2006 cropping season
Guide produced	12	18	One each in Dari and Pashto on wheat, rice, mung bean, cotton, peanut, tomato, potato, , onion, and okra
Guides distributed	2160	3150	In Dari and Pashto
Farmers trained	2025	8,411	Through field days

Annex-A

List of Tables

Comparison of average yield of target crops in demonstrations with those of farmers, fields during 2005

Comparison of average yield of target crops in demonstrations with those of farmers fields in Kunduz, Nangarhar and Helmand provinces during 2006 cropping season

The amount of different types of seeds and total production in demonstration plots in five provinces during 2005 crop season

The impact of improved varieties and adoption on the total income of farmers under 5 target provinces

The impact of best practices on farmers, income in 5 provinces

Total yield of demonstrations during 2004-2005 and area that could have been brought under cultivation

Annex-B

Executive Summary

IMPROVED TECHNOLOGIES ADOPTION RATE SURVEY

To meet the increasing demands for essential information on crop varieties and improved crop management practices, improved technology adoption rate survey was carried out in Ghazni, Helmand, Kunduz, Nangarhar and Parwan provinces covering 25 districts with a number of villages accessible for data collection. The main objective of the survey was to measure the adoption rate as a result of ICARDA/RAMP Demonstrating New Technologies project Job Order # 6 aimed at determine farmer's practices and preferences as benchmark indicators against which changes will be measured through out the progress being made by ICARDA/RAMP project implemented. This survey provides basics information in the light of which the existing and potential constraints to the diffusion and adoption of improved technologies and practices will be assessed.

A two-stage sampling technique was adopted for sample selection. In the first stage, a total of 625 villages in the selected districts of 5 provinces, random sample of 75 villages (12 percent of all villages) was selected. Each district has been distributed into three clusters and a demonstration was conducted in one village in each cluster.

In a second stage a systematic random sample of two thirds of the farmers' household was selected and interviewed. The selection of farmers' households in sampled villages started from the northern corner of the village and then two thirds households were selected on random basis. On the average 60 households per village were taken into consideration, then the sample included 40 farmers per village with a total sample of 3000 farmers interviewed in the five provinces.

One enumerator and one coordinator/monitor, after intensive training, used one questionnaire format for each respondent. The ICARDA central office staff in Kabul and one coordinator/monitor from each ICARDA Sub-Office monitored the enumerators to ensure accuracy of the interviews in the field. The data was classified in tables rounded to zero decimal points with frequency distribution, percentage and charts for analysis purposes.

Landholding size was generally small, 5 jeribs or less while in a few cases it was between 6 to 10 jeribs. Wheat cultivation was very much common, which was mostly cultivated in small size farming. As per the source of secondary information and information obtained through briefing of the enumerators, local wheat varieties are rare in the study area and the so called local varieties are in fact the improved varieties but not recommended. This is why the majority of the respondents (61%) reported cultivating local wheat varieties. The reasons for not cultivating improved recommended varieties included the unavailability of the improved recommended varieties, shortage of irrigation water, farmers' weak purchasing power and unavailability of credit.

However, the majority of the respondents (52%) have not cultivated potatoes. Wheat cultivation being common in all the surveyed villages covered 500 jeribs to 1001 jeribs/village. It was not the case with potatoes, which was cultivated in a limited area ranging from 50 to 55 jeribs per village.

The great majority of the respondents adopted the best practices, but could not continue their uses due to the unavailability of improved crops, shortage of irrigation water, poor economy and unavailability of credit.

The use of best practice has been very much rewarding, where the majority of the respondents (43%) obtained 803 kg to 853 kg per jerib in comparison to 350 kg to 400 kg by not using the best practices. This represents 121% increase in yield by using best practices in wheat farming. Market location and access to extension have not been a problem. However, in comparison to Helmand, Ghazni and Kunduz, villages in Parwan and Nangarhar are located relatively close to market, which ranges from one to five kilometres.

Farmers interviewed have not reported the production of surplus seed of wheat and potatoes in the five provinces.

As per the project impact during 2004 a total of 232 MT wheat seeds have been produced through demonstrations only. The total income from this amount of seed would best be estimated (32944x80= 2,635,520) Afs 2,635,520 or $ 52,710. Moreover, the total income estimated in 625 villages under the project work is $ 28,314,675.

Full survey report has been separately submitted to RAMP before.

Attachments